



Kimberley Islands – microcosms of the mainland’s flora and vegetation

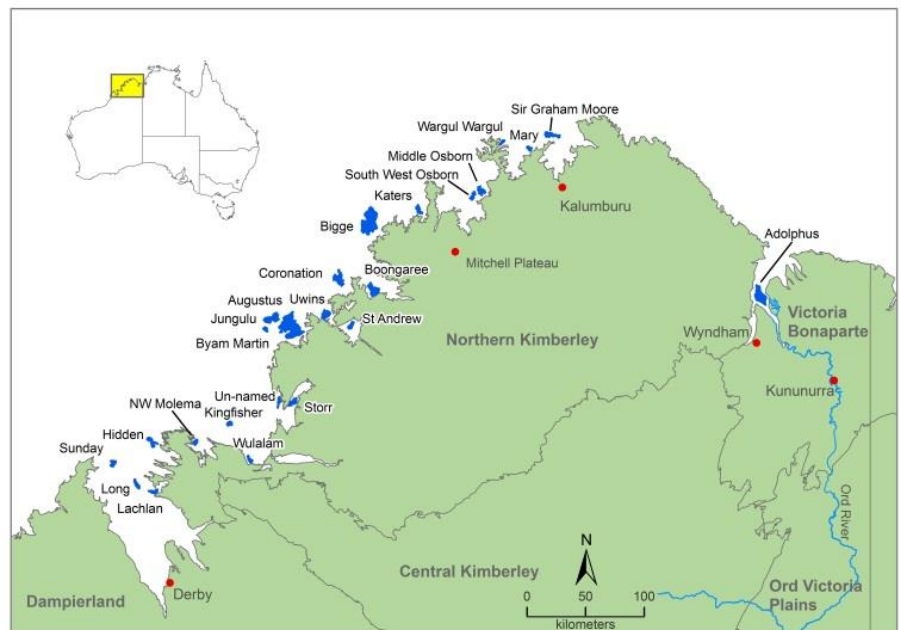
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Background

The Northern Kimberley (NK) bioregion is recognized as one of Australia’s 15 biodiversity hotspots and is one of the world’s few remaining tropical areas with largely intact ecosystems. Despite this, ongoing and emerging threats to the regions flora and fauna including inappropriate fire regimes, weeds, feral animals, and the arrival of cane toads will continue to impact on the regions conservation values.

More than 2600 islands are scattered along the NK coast, ranging in size from a few hectares to the largest, Augustus Island at 18 929 hectares. Currently the islands are largely free from the threatening processes impacting the adjacent mainland and represent a unique management opportunity to contribute to the conservation of major elements of the mainland’s flora and vegetation.

As part of an integrated biological survey (see Information sheet 14/2009) the flora of 24 selected islands was surveyed between 2007 and 2010 in both the wet and dry seasons. Sampling was quadrat based with general collecting to supplement the quadrat data. Sampling aimed to capture major geological surfaces on each of the islands. To provide a perspective on the islands flora the known flora of the entire NK bioregion was compiled from herbarium records and compared to the survey data.



Map showing survey islands

Findings

- We recorded 1005 taxa from the surveyed islands. This represented 49 per cent of the known flora of the NK bioregion including previous collections from islands. The survey added 403 taxa to the known flora of NK islands. Collectively the island flora of the NK is a subset of the NK mainland flora with very few taxa only known from islands (five taxa). Fifty seven taxa of conservation significance were recorded, with the largest islands, Bigge (14 taxa) and Augustus (15 taxa), having the most listed taxa. The richness of taxa endemic to

the NK was positively related to island size and rainfall, with the highest numbers on Bigge, South West Osborn and Augustus islands

- Patterning in the vegetation across the islands was driven by climate, geology and local soil attributes. The broad compositional patterns in the island floras reflected the phytogeography of the mainland, with islands in the south being drier and including floristic elements of the adjoining Central Kimberley and Dampierland. In the north, Adolphus Island was compositionally distinct, reflecting both the presence of broad alluvial flats that did not occur on other surveyed islands and its proximity to the east Kimberley.



Aidia racemosa

- The islands were found to be largely weed free except for the ubiquitous *Passiflora foetida* (Stinking Passion Flower), and *Bidens* spp. occurring on eight islands. The flora of Sunday Island with a long history of modern settlement, including agricultural activity, included 22 weed species. Notably, the only survey records of the weedy grasses *Cenchrus* spp. came from Sunday. Sir Graham Moore Island with an agricultural settlement in the 1920's and the base for military operations during the second World War had eight weed species including the only survey record of *Hyptis suaveolens*, a major weed of the NK mainland. Adolphus Island had nine weed species including *Parkinsonia aculeata*. Its location at the mouth of the Ord River and the likely delivery of weed propagules from the mainland by flood waters highlights the difficulty in preventing weed invasion of some close inshore islands.
- A prominent feature of the islands observed during the survey was the long unburnt nature of the vegetation. Fire sensitive rainforest taxa were observed to be widely distributed outside discrete rainforest patches, suggesting infrequent fires. Additionally, examples of vegetation known to be under threat from frequent fires on the mainland were documented on the islands. For example, mature *Callitris columellaris* a fire sensitive obligate reseeder, was recorded as both extensive stands and in 'fire protected' sites amongst rugged sandstone on several islands.

Callitris columellaris



Management Implications

- The largest and wettest islands are particularly important for conservation as they supported the highest number of NK bioregion endemic plant species, as well as priority taxa.
- In terms of representing the diversity of plant communities on the NK bioregion islands, the compositional differences of the communities on the sandstones from those occurring on volcanic surfaces highlights the importance of protecting a suite of islands that capture this geological diversity.
- The low number of weed species detected on the islands reflects their near-pristine condition and highlights the importance of quarantine measures to prevent any future incursions, particularly as human activity along the Kimberley coastline is rapidly increasing.
- Increasing human visitation may also result in increased fire frequency, and if unmanaged, fire-sensitive vegetation is likely to be at risk. The development of fire management plans is essential.

Further information:

M.N. Lyons, G.J. Keighery, L.A. Gibson and T. Handasyde (2014). Flora and vegetation communities of selected islands off the Kimberley coast of Western Australia. *Records of the Western Australian Museum* Supplement 81: 205-243.

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